

JPRS 74581

15 November 1979

Worldwide Report

ENVIRONMENTAL QUALITY

No. 231



FOREIGN BROADCAST INFORMATION SERVICE

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REPORT DOCUMENTATION PAGE		1. REPORT NO. JPRS 74581	2.	3. Recipient's Accession No.
4. Title and Subtitle WORLDWIDE REPORT: ENVIRONMENTAL QUALITY, No. 231		5. Report Date 15 November 1979		
7. Author(s)		6.		
9. Performing Organization Name and Address Joint Publications Research Service 1000 North Glebe Road Arlington, Virginia 22201		8. Performing Organization Rept. No.		
12. Sponsoring Organization Name and Address As above		10. Project/Task/Work Unit No.		
		11. Contract(C) or Grant(G) No. (C) (G)		
		13. Type of Report & Period Covered		
15. Supplementary Notes		14.		
16. Abstract (Limit 200 words) This serial report contains worldwide press and radio coverage of environmental pollution and its effects; and pollution control technology, organizations, and programs.				
17. Document Analysis a. Descriptors Worldwide Pollution Environmental Control Meteorology Ecology				
b. Identifiers/Open Ended Terms				
c. COSATI Field/Group 4, 6, 18G, 18H				
18. Availability Statement Unlimited Availability Sold by NTIS Springfield, Virginia 22161		19. Security Class (This Report) UNCLASSIFIED		21. No. of Pages 57
		20. Security Class (This Page) UNCLASSIFIED		22. Price

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CONSERVATIONISTS WARNED AGAINST OVERDEPENDENCE ON GOVERNMENT

Perth THE WEST AUSTRALIAN In English 28 Sep 78 p 9

[Text] Canberra: The Federal Government yesterday warned voluntary conservation groups not to rely solely on Government hand-outs.

The warning came from the Minister for Science and the Environment, Senator Webster, in a statement in which he announced a review of the Government's yearly grants programme for the groups.

He said the Government was concerned that the voluntary conservation movement retained its impartiality and independence and did not become too reliant on Government assistance.

Senator Webster announced the review at the same time as giving details of new grants worth \$350,000 to 25 conservation groups.

The grants programme has been operating since 1972-73 and so far \$2.4 million has been paid out.

Senator Webster said that the scope of the grants programme and the criteria used for allocating the money would be reviewed.

He believed that the programme should be mainly directed towards groups who performed a national or broad geographic role on matters of environmental importance.

He said he hoped that the review would be completed early next year in time for new criteria to be applied to next year's programme.

Senator Webster said the 1979-80 grants, made on a \$1-for-\$1 basis, would become available when Parliament approved the Budget.

Labor's environment spokesman, Mr B. Cohen (NSW), said that the Government was persisting with its policy of reducing funding to conservation groups.

The grants include:

- Australian Conservation Foundation, \$160,000.
- W.A. Environment Centre, \$13,000.

AUSTRALIA

BRIEFS

COASTAL CONSERVATION GROUP--A professor of geography will head the newly formed nine-member NSW Coastal Council, which will advise the State Government on the management and conservation of the NSW coastline. He is Professor Trevor Langford-Smith, the McCaughey Professor of Geography at Sydney University. Professor Langford-Smith's appointment as chairman was announced yesterday by the Minister for Planning and Environment, Mr Landa. Mr Landa said the other members of the council were: Mr Ian Sim, principal planner, metropolitan and regional planning, NSW Planning and Environment Commission; Mr J. Starling, planning co-ordinator, National Parks and Wildlife Service; Mr B. Guilfoyle, landscape director, National Trust of Australia; Mr D. Francoi, director of fisheries, NSW State Fisheries; Mr G. Rose, Department of Mineral Resources and Development; Dr R. Higginson, director of chemistry, Biological and Chemical Research Institute, Department of Agriculture; Mr W. Kerle, Public Works Department; and Cr R. Power, Warrigah Shire Council, representing local government. [Text] [Sydney THE SYDNEY MORNING HERALD in English 21 Sep 79 p 8]

FORESTRY ENVIRONMENT OFFICER--One of the most highly qualified foresters in Australia, Dr Wal Gentle, has been appointed an assistant NSW Forestry Commissioner with special responsibility to help overcome long-term, environmental problems. The Minister for Conservation and Water Resources, Mr Gordon, who is also in charge of forests, chose Dr Gentle for the task. Dr Gentle's prime area of responsibility will be to handle long-term planning to resolve environmental conflicts in forestry production. One of his main responsibilities in this field will be planning the development of private forests. Mr Gordon's department is close to presenting to Cabinet a private forestry scheme which it hopes will ease the pressure from conservationists for preservation of State forests. Government authorities said yesterday that Mr Gordon had been concerned for some time about the need to deal with the environmental problems facing the Forestry Commission. [Excerpts] [Sydney THE SYDNEY MORNING HERALD in English 21 Sep 79 p 11]

CSO: 5000

AUTHOR: WANG Juning [3769 5468 0413]

ORG: Institute of Public Health, Chinese Academy of Medical Sciences

TITLE: "Problems in Identifying Mutagenic, Carcinogenic, and Deformity Inducing Chemicals in the Environment"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 1, Feb 78 pp 6-9, 48

ABSTRACT: The paper first explains the urgency of understanding the harmful effects of environmental contaminants as the rapid development of industries have caused great changes in the human environment. The relationship between mutagenics, carcinogenics, and deformity inducing agents are discussed in terms of the structure, the property, and the chemical composition of DNA. Various techniques of microbiological, parasitological, and epidemiological tests to determine the effects of a contaminant are briefly reviewed.

AUTHOR: None

ORG: Institute of Environmental Chemistry, Chinese Academy of Sciences; Beijing Municipal Leather and Fur Plant

TITLE: "Study on Repeated Use and Management of Liquid Waste of Leather and Fur Dyeing Process"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 1, Feb 78 pp 10-12, 43

ABSTRACT: Through various experiments, this paper reports techniques of treating liquid waste of the leather and fur dyeing process. Ways of neutralizing and precipitating are evaluated and an optimum mixing technique for repeated utilization of the liquid waste is selected. With this technique the liquid waste may be utilized repeatedly for 6 times while the quality of the dyed leather and fur remains satisfactory. The needed equipment is simple and the required capital investment is low, while the technique achieves the purpose of eliminating the damage to the environment through comprehensive utilization. The technique is more suitable for intermediate and small plants.

AUTHOR: CHEN Chuanqun [7115 0278 5028]
XU Yinliang [1776 1377 5328]
YE Zhaojie [0673 0340 2633]
YU Xixiang [0060 6932 4382]
SU Hongyuan [5685 1347 3220]
WU Jianshi [0702 1017 1102]

ORG: CHEN, XU, YE of Zhejiang University of Agriculture; YU, SU of the 401 Institute, Chinese Academy of Sciences; WU of Hongzhou Leather Factory

TITLE: "Application of Neutron Activation Technique in the Study of the Principle of Variation of Chromium Containing Liquid Waste in Crop Plants and Soils"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 1, Feb 78 pp 13-16, 54

ABSTRACT: Chromium compounds are extensively used in electroplating, leather making, chemical industries, dyes, iron and steel industries, etc; therefore, liquid waste contains chemicals of various densities of chromium. In the past several years, chromium-containing liquid waste of factories of some regions has been used to irrigate farm land or to be mixed with fertilizer and certain yield increase results have been obtained. The principle of distribution, accumulation, and harmful contamination of Cr^{6+} and Cr^{3+} have yet to be systematically studied in China, however. The authors adopted the technique of neutron activation to carry out a preliminary study of chromium contents of crops and soils before and after irrigation with chromium containing liquid waste and the principle of their variation. The technique and the results of the study are reported. The basic theory of neutron activation analysis is also explained.

AUTHOR: SUN Daoyuan [1327 6670 0337]
CHEN Mu [7115 2606]

ORG: Both of Institute of Oceanography, Chinese Academy of Sciences

TITLE: "A Survey Study of Xiaotouchong (*Capitella capitata*) as the Index Organism for Organic Pollution"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 1, Feb 78 pp 17-19

ABSTRACT: The sewage of Qingdao City and oil waste of the harbor are gathered primarily into the Qingdao Bay. The authors established four specimen collecting lines in the vicinity of the effluence to collect periodically the benthos, the water, and the floor sediments. The water temperature, the chlorinity, the dissolved oxygen, the pH, and the hydrogen sulfide are also determined. In April 1963, the density of *Capitella capitata* was 127,200/m²; today, it is 24,200/m². In the polluted zones, *Musculus senhousi*, *Macoma incongrua*, *Venerupis philippinarum*, etc. can still be found. Although these findings seem to indicate improvement, the fact that dead shells of *Musculus senhousi* are more numerous than live ones of this species may indicate that it is possible to use it as an index organism to divide the contaminated and semi-contaminated zones of the bay in the effort of further improvement.

AUTHRO: None

ORG: Natural Geography (Environmental Protection) Specialty, Beijing University

TITLE: "Investigation Into the Self-Cleansing Action of Cyano-phenolic Liquid Waste in Drainage Channels"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 1, Feb 78 pp 20-24

ABSTRACT: The coking factories of the steel and iron mills are one of the major sources of stream contamination by cyano-phenolic liquid waste. This problem is rather extensive worldwide. With the assistance of Beijing Municipal Institute of Environmental Protection and other organizations, the authors carried out a preliminary study on the self-cleansing action of cyano-phenolic liquid waste in streams of no or little dilution effects in a region of North China with two relatively large scale coking plants. Geographically, the plants are both in points far away from natural streams. The liquid waste flows through drainage ditches for several to several tens of km before reaching a natural stream. Specimens for the study are collected at 5-10 km from the plants and before the ditches join any body of flowing water. The results demonstrate that, when there is no mixture of other forms of toxic waste, the self-cleansing action is sufficiently strong to reach the permissible density if it flows 2.5-5 hours, the equivalent of several tens of km before it reaches a body of surface water. Several measures to accelerate the self-cleansing action are suggested.

AUTHOR: None

ORG: Water Pollution Group, Chongqing Knitting Factor and Chongqing Academy of Construction Engineering

TITLE: "Treatment of Liquid Waste of the Dyeing Process of Knitting Fabric Plant With Oxidation Channel"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 1, Feb 78 pp 25-30, 48

ABSTRACT: This paper describes briefly the condition of oxidation channel development in recent years. The major parameters of various turn-over cycles in the oxidation channel and their interrelationships are analyzed. Experiments carried out to investigate the effect of using oxidation channel to treat the liquid waste of the dyeing process at knitted fabric plant and problems relating to its management are reported.

AUTHOR: None

ORG: Changzhou Petrochemical Plant; Shanghai College of Chemical Engineering

TITLE: "Research Study on the Use of Ozone Oxidation Technique for the Treatment of Liquid Waste the Heavy Oil Cracking Process"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 1, Feb 78 pp 31-37

ABSTRACT: The oxidation capacity of ozone is inferior to fluorine but twice as high as that of chlorine, and oxidation reaction can be completed instantly under low density condition without leaving permanent residues. Ozone can effectively remove phenolic, cyanide, sulfide, and oil compounds and is also good for removing color, odor, and bacteria. The Changzhou Petrochemical Plant has a capacity of cracking 15,000 tons a year and the key problem of its expansion and development has always been the effective treatment of its waste materials. This paper introduces the experimental data of ozone waste treatment technique and the various factors influencing its effectiveness. It appears that as the temperature of the liquid waste is raised, the speed of the ozone oxidation reaction increases and the treatment effect becomes obviously higher.

AUTHOR: None

ORG: Public Health Research Office, Hygiene Institute, Chinese Academy of Medical Sciences

TITLE: "Dust and Smoke Testing Instrument"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 1, Feb 78 pp 38-43

ABSTRACT: The dust and smoke of industrial origin are often of high density, high temperature, high humidity, and corrosive. Special instruments are, therefore, needed to monitor the exhaust of smokestacks. In 1974, after consulting foreign references, the authors began to study and make a set of instruments to be used for continuous monitoring of dust and smoke from smokestacks. In the past three years the instruments have been put into field tests and short courses for training special technicians to operate and monitor the instruments have been set up in various regions. The instruments, their properties, and the method of operating them are reported.

AUTHOR: None

ORG: Environmental Protection Group, Shanghai Institute of Plant Physiology,
Chinese Academy of Sciences

TITLE: "Artificial Smoke Room for Plant Tests"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 1, Feb 78
pp 44-46

ABSTRACT: An artificial smoke room is a necessary equipment for studying the relationship between plants and air pollution. The extent of damage of pollutants to plants and the response of plants to air pollution vary with the quantity of the pollutant and the species of the plant as well as the environmental condition. The artificial smoke room, therefore, must be designed in such a manner to make it possible to control its environment to suit a given test. This paper describes the structure, the ventilation equipment, the poisonous gas input apparatus, the lighting installation of the artificial smoke room designed by the group. After more than one year's application, it has been proved to be satisfactory. Its major properties are also described.

AUTHOR: TANG Yongyi [0781 3057 0076-6855]

ORG: Department of Geography, Zhongshan University

TITLE: "Environment and Environmental Science"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 1, Feb 78
pp 47-48

ABSTRACT: Environmental science is a new field, currently receiving a great deal of attention all over the world. It receives input from many sciences while is also quickly being divided into many new branches, including environmental geography, environmental biology, environmental chemistry, environmental physics, etc. On some basic problems, such as the object of its study, its contents, and its responsibility, consensus have yet to be reached. This may be said about many other long established sciences as well, however. This paper, in a very briefly manner, attempts to define the terms of environment and environmental science. It is the author's opinion that environmental science should be a natural science and a basic science (versus the opinion of regarding it a field of technology) with major responsibilities of surveying, monitoring the quality, forecasting the problems, and protecting the environment. It also has the job of providing scientific bases and strategic plans of protecting and improving the environment.

AUTHOR: TAO Bokai [7118 5508 2818]

ORG: Water Supply and Drainage Teaching and Research Group, Qinghua University

TITLE: "Application of Ozone in Water Treatment (I)"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 1, Feb 78
pp 49-54

ABSTRACT: The use of ozone as an oxidation agent began soon after its discovery in 1840. A productive water supply plant using ozone as the purifier was constructed in Nice of France in the beginning of this century and since then, many other countries have also built plants using ozone to disinfect the water supply of cities. In recent years, new and improved designs of ozone generators have caused the surface accumulation of ozone per unit electrode to be raised 2-3 times; therefore, the cost of building and operating the equipment has been greatly reduced. This paper introduces the basic property of ozone, the method and the equipment used to produce ozone, and research studies, applications, and effects of using ozone for water treatment. Even though it has long been maintained in the United States that chlorine is less expensive as a water purifier, tests of using ozone in the place of chlorine are being earnestly carried out at present in that country.

AUTHOR: None

ORG: Suzhou Knitted Undergarment Plant

TITLE: "Technique of Improving the Rate of Ozone Production and Reducing the Cost of Electricity"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 1, Feb 78
p 61

ABSTRACT: Suzhou Knitted Undergarment Plant has been using ozone to treat the liquid waste of its dyeing process. Very good results have been obtained. They also have carried out studies on techniques of improving the ozone production rate and reducing the consumption of electricity. The frequency of the AC and DC electrical fields adopted for the ozone generator affects the quantity of ozone production. It appears that there is a given relationship between the magnetic field and ozone production. From this observation, three coils were added to the circuit. As a result, the productivity was raised 20 percent and the power consumption was reduced 40 percent. In fact, the total efficiency of ozone production was doubled. This preliminary benefit of experimentation is reported. Further improvement is being attempted.

AUTHOR: None

ORG: Ningxia Institute of Industrial Hygiene

TITLE: "Experimental Manufacture of Reverse Coincidence β Ray Instrument Using Semiconductor Probing Device"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 1, Feb 78 p 61

ABSTRACT: In order to meet the need of monitoring environmental radiation, the Ningxia Institute of Industrial Hygiene experimented and made a reverse coincidence β ray instrument using a semiconductor probing device. The structure of the instrument is briefly described. At present, problems concerning the magnetic shield, the circuit, the noise level, and the reliability of the instrument are still being further improved.

AUTHOR: None

ORG: Environmental Hygiene Teaching and Research Group, Shanghai First College of Medicine

TITLE: "Toxicity Test of Nitrites in Surface Water"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 1, Feb 78 p 62

ABSTRACT: When a body of water is contaminated by organic substances, the nitrite content of the water increases, while industrial waste may also contain nitrites. When nitrites enter the body of animals and humans, the oxygen carrying capacity of the blood will be obviously reduced to cause poisoning. A test with white mice was carried out by the group to learn the process, dosage, and symptoms of nitrite poisoning. Identical tests were also made with dogs and the results were the same. It was learned from the experiments that when the density of NO_2^- in the water is in the range of 0.05-25 mg/l, it has no obvious effect on the biochemical oxygen consumption process of the surface water. It has, therefore, suggested that the maximum permissible density of NO_2^- in the surface water should be 0.2 mg/l.

AUTHOR: None

ORG: Shanghai Institute of Organic Chemistry, Chinese Academy of Sciences

TITLE: "Utilization of Waste Material of Nitrile Fiber"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 1, Feb 78
pp 62-63

ABSTRACT: As China's petrochemical industry grows, the quantity of nitrile fiber production also increases in a large scale. In the production process, large quantities of waste materials in the form of fiber, lump, or pulp are also produced. Several large nitrile fiber manufacturers together produce yearly thousands of tons of such waste materials. In the past, these waste materials were buried or burned to create lots of waste as well as air pollution. Foreign literatures report treatment of such wastes with acids or alkalines, but none of these methods is ideal. With the help of others, the Shanghai Institute of Organic Chemistry spent three months to experiment with the technique of using pure water to dissolve the waste materials to make an adhesive. Preliminary tests have proved that the product, called the 108 adhesive, is stronger than animal glue. The 108 adhesive is not water soluble; therefore, in the process of producing it, there is no secondary pollution. Currently, plans are being made to produce this adhesive in a large scale in Shanghai.

AUTHOR: None

ORG: Guangdong Provincial Environmental Protection Office

TITLE: "Reclaim Potassium Fertilizer From the Ash of Vertical Kilns"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 1, Feb 78
p 63

ABSTRACT: Xinhui Cement Plant designed, made, and installed by its own workers an attachment to its vertical kiln to reclaim the ash as potassium fertilizer. The capital investment was only 1¹/₂ thousand yuan and it took only 8 tons of steel to make the attachment. Instantly, the dust pollution problem of the kiln was resolved. The smoke became clean and the air pollution problem resolved. The potassium fertilizer thus obtained is valuable for agricultural support. Preliminary tests indicate that when the temperature control is normal (80-100°C) the fiberglass bag can absorb all the dust to reclaim 600-800 kg of potassium fertilizer per day. The fertilizer contains 8 percent soluble potassium.

AUTHOR: None

ORG: Hefei Leather Factory

TITLE: "Using Waste Of Leather Manufacturing Process to Produce Protein Jel"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 1, Feb 78
p 64

ABSTRACT: In the process of leather manufacturing, the waste skin residue and spoiled meat can be used to make glue or nitrogen fertilizer. These waste materials may also be used to produce protein jel which can be used as the culture base to produce tetracycline. On the basis of a successful experiment with producing liquid protein jel from its own waste, Hefei Leather Factory constructed a set of equipment in 1975 to produce 100 tons of solid protein jel a year. The production procedure and the drying process are briefly described.

AUTHOR: None

ORG: Xining Steel Mill, Qinghai Province

TITLE: "Research on the Comprehensive Utilization of Gas Residues"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 1, Feb 78
p 64

ABSTRACT: Originally, the residual oil used to surface roads in Qinghai Province contained 30-40 percent moisture. There were lots of difficulties in the road surfacing work because of the high water content. The residues of gas production in Xining Steel Mill of Qinhai reached ten thousand tons a year and all of them were burned to create a serious problem of air pollution. Following research and experimentation, ways were found to extract from the residues, a coal tar which makes a good road surfacing material, and phenols which are important industrial raw material. These techniques have helped highway construction, resolved problems of environmental contamination, and saved about one million yuan for the state.

6168

CSO: 5000

ENVIRONMENTAL SCIENCE

AUTHOR: GONG Kunyuan [7895 0981 0337]

ORG: Institute of Zoology, Chinese Academy of Sciences

TITLE: "Problem of the Future of Application of Agricultural Chemicals"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 2, Apr 79 pp 1-5

ABSTRACT: Carcinogenic, mutagenic, and sterilizing effects of chemicals for agricultural use are briefly discussed. The author maintains, however, biological control measures are still not the most economical neither the most effective techniques. In the United States, more than 500 natural enemies of pests have been introduced in the past 80 years, and only twenty of these remain useable today. The author claims that the problems of chemicals rest mostly in quantity and when harmful effects of a chemical are tested, the technique of small dosage and long term observation must be employed in order to be practical. Finally, the author urges Chinese scientists to create, produce, apply, and study agricultural drugs to catch up the advanced level of the world.

AUTHOR: None

ORG: Environmental Hygiene Teaching and Research Office, Wuhan College of Medicine

TITLE: "Problem of Harmful Effects of Mercury Pollution of Waters on Men"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 2, Apr 79 pp 6-10

ABSTRACT: The problem of methylation of inorganic mercury by marine organisms as it was discovered in Japan and elsewhere since 1963 is discussed. The authors maintain, however, that the methyl conversion rate of the sediments is limited and the density of methylated mercury in water is extremely low; therefore, mercury intake in drinking water is not a problem. The extent of mercury contamination can only be determined by the mercury content of marine organisms, and the concrete understanding of the effect of mercury on men can only be gained through physical examination of inhabitants as well as a knowledge of the quantity of marine organisms habitually eaten by those inhabitants.

AUTHOR: WANG Shuhai [3769 2579 3189]
HAO Tianchao [6787 1131 2600]
LIU Guiqin [0491 2710 3830]

ORG: None

TITLE: "Experimental Research on the Rate of Release of Methylated Mercury by Sediments"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 2,
Apr 79 pp 11-14, 27

ABSTRACT: An experiment is designed to test the rate of release of methylated mercury by sediments of a body of water containing mari organisms (fish), to produce the following results: (1) Under the condition of 20 °C water temperature, the rate of release is $0.39 \mu\text{g}/\text{m}^2$ (bio-concentration technique) - $5.06 \mu\text{g}/\text{m}^2$ (chemical concentration technique); (2) Many factors influence an uneven distribution of the rate of release in a given section of the water, with micro-organisms the major factor; (3) With pollution control, the quality of water improves and the rate of release of methylated mercury by the sediments will also increase as the water becomes more favorable for the activity of micro-organisms; (4) Under anaerobic conditions, the mercury release rate of a given point is very weak; therefore, the deep burying technique should be effective. The effect may be enhanced if sulfur-containing substances are used to cover the area where sediments of high mercury content are deeply buried.

AUTHOR: None

ORG: Corrosive Fluid Team, Department of Chemistry, Guizhou University

TITLE: "Research on New Corrosive Fluid for Printed Circuits"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 2,
Apr 79 pp 15-20

ABSTRACT: For a long time, iron trichloride is used in China as the corrosive fluid in the process of making printed circuits. This chemical has many shortcomings, however. After reviewing related studies in foreign countries, close to 100 mixtures were tested to arrive at a new fluid, $\text{H}_2\text{SO}_4\text{-H}_2\text{O}_2\text{-H}_3\text{PO}_4\text{-AgNO}_3\text{-phenacetinum}$. Ratios of the above are determined to form a new mixture to be applied to Pb-Sn alloy plates. A new high acidity technique for reclaiming copper sulfate is proposed.

AUTHOR: XIA Zenglu [1115 1073 4389]
ZHONG Zhusang [6945 0146 2718]
ZHENG Yingwu [6774 7336 0710]
MENG Weiqi [1322 4850 1142]

ORG: None

TITLE: "Effects of Irrigation With Phenol, Cyan Contaminated Water on Soils and Ground Water"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 2, Apr 79 pp 21-27

ABSTRACT: This paper reports the study of problems of soil and ground water pollution in the western suburb of a certain North China city where phenol, cyan containing water has been used for irrigation. At the two points of study, the major concentration of phenol and cyan was found in the 20-30 cm layer of soil. The downward seepage of the contaminated water after irrigation reaches about 40-100 cm. If the soil is thick, the irrigation water does not seep directly to contaminate the ground water, but when the contaminated soil is leached by precipitation, a small amount of phenol and cyan may reach the ground water. This condition is localized and the quantity is minute. The major pathway of contamination to water is through drainage channels and seepage of some rice paddies. Judging from laboratory test results and concrete analysis of the conditions of that locality, it is believed that the permissible limit of cyanide content of the irrigation water in that region should be set at 0.5 ppm.

AUTHOR: None

ORG: Tree Purification of Air Group, Liaoning Provincial Institute of Forestry and Pedology

TITLE: "Smoke and Dust Resistant Tree Species in Liaoning Province"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 2, Apr 79 pp 28-31

ABSTRACT: At present, the afforestation of seriously polluted areas of Liaoning Province is hampered primarily by singularity of tree species causing the survival rate to be very low. In areas of high concentration of factories, the air is being polluted by more than one hundred types of harmful gases, including sulfur dioxide, chlorine gas, fluorides, lead, mercury, cadmium, etc. Funigation tests are carried out to determine the smoke and dust resistance of major species of trees and shrubs. It is the conclusion of these studies that smoke and dust resistance of a species is closely related to its external morphological characteristics, and species of the family Leguminosae have higher resistance.

AUTHOR: None

ORG: Jinxi Petroleum Fifth Plant

TITLE: "Treatment and Utilization of Acid Residues"

SOURCE: Beijing HUANGJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 2,
Apr 79 pp 32-34

ABSTRACT: In the process of thermal cracking and other forms of refining to produce diesel, transformer oil, etc. a large quantity of acid residues is also produced. If this waste is drained into mountain hollows or the sea without treating it first, the environment will be contaminated by it. Jinxi Petroleum Fifth Plant experimented with the distillation technique and found it to be simple and effective. After distillation, ammonium sulfate is produced to become the raw material to make phosphorus fertilizer. What is left over is acid residue oil, which can be used as fuel or as a wood preservative. It may also be heat condensed to become synthetic tar. These techniques are described.

AUTHOR: None

ORG: Guiyang Aluminum Magnesium Designing Academy; Academy of Architecture, Ministry of Metallurgy

TITLE: "Bitumen Smoke Absorption Experiment With Aluminum Oxide"

SOURCE: Beijing HUANGJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 2,
Apr 79 pp 35-38

ABSTRACT: The smoke in the electrolysis tank is produced by evaporation of bitumen when it is in the process of being burned. The type of bitumen used by the electrodes is the final residue of distilled coal tar. This bitumen contains many volatile and photosensitive substances that are very harmful to men. An experiment was carried out to use aluminum oxide for dry absorption of the smoke. In order to guarantee the quality of the aluminum oxide, saturation absorption is not suitable. The work process and related data are presented.

AUTHOR: LONG Ao [7893 2407]
JIN Genming [7246 2704 2494]
GE Yuanxin [5514 0337 4423]
HU Zhiyu [5170 1807 3558]
DAI Guangxi [2071 0342 5032]

ORG: All of Lanzhou Institute of Modern Physics, Chinese Academy of Sciences

TITLE: "Heavy Ion Activation Technique for the Determination of Lead in the Air"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 2,
Apr 79 pp 39-41

ABSTRACT: For the determination of lead content of the air, the heavy ion activation technique, compared with the more commonly used energy chromatic dispersion x-ray fluorescence analysis or the atom absorption spectral analysis technique, is more reliable while the cost is less. It is not suitable for the purpose of long-term monitoring, however, due to the limited availability of the material. The technique of heavy ion activation analysis is described.

AUTHOR: YANG Xiurong [2799 4423 2837]
FU Guogang [5543 0948 0474]

ORG: Both of Analytic Chemistry Specialty, Chinese University of Science and Technology

TITLE: "Research on the Use of Lead Ion Selective Electrode for Quantitative Determination of Lead in Contaminated Soil"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 2,
Apr 79 pp 42-45, 38

ABSTRACT: This paper reports the study on the use of PbS-Ag₂S pressurized plate to make lead ion selective electrode to be used for quantitative determination of lead content in contaminated soil. In the 0.1M sodium chloride medium, within the range of 5×10^{-8} - 10^{-4} M, the lead ion density $E - \log C_{Pb^{2+}}$ are in linear relationship. In the contaminated soil, lead is dissolved by HCl-HNO₃. At pH2, Cu²⁺, Hg²⁺, Ag⁺ are eliminated, using ascorbic acid to eliminate interference of Fe³⁺. At pH3.5-5.5, use the adding-in method to determine the quantity of lead. The theory of the technique, the required instrument and reagents, the condition of the experiment, and the procedure are given.

AUTHOR: TAO Baokai [7118 5508 2816]

ORG: Water Supply and Drainage Teaching and Research Group, Qinghua University

TITLE: "Application of Ozone in Water Treatment: (I)"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 2, Apr 79 pp 46-52, 41

ABSTRACT: This installment of the paper includes chapters on techniques and three different instruments used to add ozone into water for the purpose of purification; application of ozone for purification of water supply, application of ozone for the protection of source of water from contamination, application of ozone to treat liquid waste containing phenol and crude oil, application of ozone for the treatment of liquid waste containing cyan, the use of ozone as a disinfectant, the use of ozone as a reagent (catalyst), and the use of ozone as an oxidation agent in synthesis chemistry. Finally, the paper also contains a chapter discussing the toxicity of ozone and safety measures and safe density of ozone when it is applied.

AUTHOR: None

ORG: Guangdong Maba Metallurgy Plant

TITLE: "Producing Anhydrous Sodium Sulfite by Using Alkaline Fluid to Absorb and Reclaim Residual Gas"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 2, Apr 79 pp 57-58

ABSTRACT: The Guangdong Maba Metallurgy Plant uses refined ore of copper sulfide as the raw material to make such products as electrolytic copper, sulfuric acid, etc. In the process of refining the copper with the wet method, the smoke and vapor of the furnace contains SO_2 of a density of only 2-3 percent. When this smoke and vapor is purified to become acid, the residual gas still contains about 0.3 percent of SO_2 . In the end of 1970, the plant successfully experimented the technique of using alkaline fluid to absorb the residual gas to produce anhydrous sodium sulfite. This technique increases chemical products for the state as well as eliminates the harmful effect of SO_2 smoke. This technique has been in practice for 7 years. The procedure has become more and more perfect and the operation has become normal. Aside from description of the theory, the work procedure, and the needed equipment, some outstanding problems are also discussed.

AUTHOR: None

ORG: Public Health Teaching and Research Group, Zhonghsan College of Medicine

TITLE: "Shachongai Toxicity Test"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 2,
Apr 79 p 58

ABSTRACT: Shachongai is originally called chlorophenylamidine. It is a new agricultural drug synthesized in 1962. It can be effective against those pests that are resistant to organophosphorus, organochlorine, and chloromethyl ester types of drugs. Its experimental manufacture was successful in China in 1971. For the purpose of protecting the health of agricultural and industrial workers in contact with this drug, an experiment was carried out with white mice to determine its toxicity. The symptoms of poisoning, the half lethal dosage (LD_{50}), and dissection observation are reported.

AUTHOR: None

ORG: Shanghai Institute of Scientific and Technological Information

TITLE: "Ultrafiltration Technique Used in Treatment of Electrophoretic Paint"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 2,
Apr 79 p 59

ABSTRACT: Electrophoretic painting is a relatively advanced technique. After it was adopted by Shanghai Automobile Plant, the problem of draining the dirty water used in flushing occurred. In order to resolve this problem, since June 1974, Shanghai Academy of Medicinal Industry, Shanghai Municipal Machinery and Electricals Designing Academy, the Automobile Plant Designing Bureau of the First Ministry of Machines, and the Second Automobile Plant jointly experimented and made an acetate cellulose ultrafiltration membrane. It is made entirely of China made materials. At the Certification Conference on the Use of Ultrafiltration Technique for Treatment of Electrophoretic Paint held in Shanghai in December 1976, the membrane was judged to be suitable for production and extension. The property of the membrane and the instrument used for treatment are given.

AUTHOR: None

ORG: Shanghai Institute of Scientific and Technological Information

TITLE: "Laser Smoke Detecting Radar"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 2,
Apr 79 pp 59-60

ABSTRACT: In order to understand the condition of distribution of smoke and dust in the upper atmosphere of cities, newly constructed industrial smokestacks are required to have advanced equipment to measure the smoke and dust, and the remote measurement technique is usually adopted. At present, the method of sample-taking at a given point and a given time is mostly used. The result is not sufficiently representative and its implementation is rather labor and material consuming. Fudan University, Shanghai Radio Twenty-third Plant, and Shanghai Municipal Weather Bureau carried out a cooperative project of making a laser smoke detecting radar. After more than one year, the instrument has been successfully made. It can measure the location and relative density of smoke within a three km radius. The structure and properties of this laser radar are described.

AUTHOR: None

ORG: Guangdong Provincial Environmental Protection Office

TITLE: "Detoxification of Chromium Slag and Its Comprehensive Utilization"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 2,
Apr 79 pp 60-61

ABSTRACT: Chromium slag is a type of waste residue in the process of producing sodium dichromate. The water soluble hexavalent chromium contained in the slag is poisonous. Experiment was carried out jointly by Guangzhou Chromate Plant and the Department of Chemistry of Zhongshan University to use the slag to make blue bricks. Test results have proved that the detoxified bricks contain less than 0-0.14 ppm of hexavalent chromium. The bricks are very strong and large quantities of chromium slag can be consumed in the process of making them. The work procedure is simple, there is no secondary pollution, and not very much fuel is consumed. The theory, the work procedure and requirements, the detoxification effect, and the physical properties of the bricks are given.

AUTHOR: None

ORG: Xiangxiang Fluorine Plant

TITLE: "Making Liquid Sulfur Dioxide From Low Density Sulfur Dioxide"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 2, Apr 79 pp 61-63

ABSTRACT: In the process of producing hydrofluoric acid with heavy sulfuric acid and calcium fluoride, a sulfur dioxide gas is created. It cannot easily be absorbed by HF and is released into the atmosphere to contaminate the environment. After two years of experiments, a technique of using synthetic cryolite to decompose and absorb the pure soda solution which has been used to absorb the acid residual gas to produce cryolite and liquid sulfur dioxide. After successful research and experiment, the technique was officially implemented in October 1972. The problem of reclaiming low density sulfur dioxide is thus resolved and the smoke pollution is basically eliminated. The chemical reaction process of the technique, the effect, and the cost are described.

AUTHOR: None

ORG: Environmental Protection Group, Yunnan College of Forestry

TITLE: "A Plant Smoke Room With Adjustable Gaseous Mixture"

SOURCE: Beijing HUANJING KEXUE [ENVIRONMENTAL SCIENCE] in Chinese No 2, Apr 79 pp 63-inside back cover

ABSTRACT: In the process of studying the effect of atmospheric pollutants on plants, the toxic phenomenon of the plant being studied is often the effect of complex factors. In order to study the effect of a single factor and the effect of complex factors, it is necessary to carry out experiments on the basis of a single factor before expanding into experiments of multiple factors. For this reason, there is the need of an artificial smoke room the gaseous content of which can be mixed at will. This paper describes the structure of such a smoke room, the method of adjusting and mixing the gases, and the method of determination and control of the density of the gases. After the smoke room was designed and made by the authors, it has been used primarily for testing high density acute toxicity. Some problems and opinions concerning its improvement are discussed.

6168

CSO: 5000

ECONOMIC STIMULATION IN ENVIRONMENTAL PROTECTION EXPLORED

East Berlin DIE TECHNIK in German Vol 34 No 8, Aug 79 pp 437-439

[Article by Dr H. Strenge, engineer, economist, Karl Marx University, Leipzig: "Principles and Experiences in the Economic Stimulation in the Area of Environmental Protection"]

[Text] The further refinement of the economic mechanism, its adaptation to the requirements of environmental protection, is gaining more and more in importance. A part of this economic mechanism is the economic stimulation of the enterprises which takes place on the basis of central State planning. Proceeding from the economic levers for the realization of environmental protection which are contained in the legal regulations of the GDR, presented here are principles, experiences, and also problems in connection with the effective economic stimulation of environmental protection.

A component in the further deepening of the process of intensifying social production and in further improving the working and living conditions of all members of the socialist society is the systematic utilization and organization of socialist environmental measures, included in which is the protection of man's natural environment. It is imperative that the metabolic process with nature "be established systematically as a governing law of social production, in a form appropriate to complete human development" [1].

The consistent orientation of the economic mechanism of the socialist society toward further raising the standard of living of all working people, both in the present and in the future--as such a future finds its visible expression in the economic and social policy of the GDR--places high demands on the management, planning, and economic stimulation of environmental protection, in the interests of the preservation, continual improvement, and sensible utilization of nature as the basis for life and production.

In recent years, the SED and the government of the GDR have done extensive work in the area of environmental quality and for the sake of the expansion of environmental protection, which is reflected, among other ways, in the following results: In the last 5-year plan, almost 10,000 hectares of land have been reclaimed for cultivation, in certain locations it has proved possible to reduce the pollution load from particulates and sulfur dioxide, and last year a further increase in water pollution could be prevented in connection with a rapidly increasing industrial and agricultural production, and locally an improvement was even achieved [2].

With the further expansion and modification of production and consumption, with the higher demands of people living in the socialist society on their natural environment, as well as with the changing reproduction conditions as a whole,¹⁾ the further refinement of the economic mechanism and its adaptation to the requirements of environmental protection is gaining more and more in importance. A part of this economic mechanism is the economic stimulation of the enterprises, institutions, and so forth which takes place on the basis of central State planning, and which in the socialist society is done according to scientific principles. In this connection, certain principles and experiences associated with the economic stimulation of environmental protection will be pointed out.

First: The extent of burdening the natural environment with contaminants is to be reduced or prevented altogether²⁾ above all by putting scientific-technical progress fully in the service of environmental protection. In the development of new procedures, technologies, and products, as well as in the reorganization process, the concerns of environmental protection are to be taken into account. Analyses with respect to the effectiveness of those economic levers which are contained in the legal provisions of the GDR and which concern environmental protection show that the enterprises and institutions are substantially interested in the utilization of scientific-technical progress and are thereby eager to improve the natural environment. Thus, for example, since the time of the Ninth Party Congress of the SED, in the PCK [Petrochemical Combine] "Otto Grotewohl" of Boehlen it has proved possible to lower substantially the noise stress in the power house of its power station with the aid

¹⁾ Among these are, for example, the new conditions in the mining of existing mineral resources, the building of new city districts and production plants, the regional concentration of the population and of industry, the alteration of peoples' consumption behavior, and limits on the ability or capacity for assimilation of the given environment.

²⁾ It must be stressed here that it is not a question of the complete elimination of the environmental pollution load, but of an environmental load which is below the critical risk threshold.

of scientific-technical progress (by 15 to 20 decibels, on the average). The legal regulation on protection from noise, by way of additions to the prices for products bearing the quality seal "Q," has also proved successful [3].

Second: The economic stimulation must help bring about the situation where the enterprises, combines, and institutions will include additional environmental measures in their contingency planning as well. This presupposes that no disadvantages arise for the enterprises from such an undertaking. Practice shows that enterprises are frequently prepared to undertake the realization of additional environmental-protection measures only if these bring them some gain which lies above the average or the required profitability. Supposing they are not carrying out planned tasks of environmental protection which show a low or zero economic effectiveness, it then always has a favorable impression on the enterprises when in the planning period it is seen that the effects of these measures do not or do not appreciably limit the growth of production and consumption. This approach has proved successful when the planned environmental-protection measures are balanced, are coordinated with all the planning sections of the operational plan, and are taken as a basis for the performance evaluation of the enterprises.

Third: The economic stimulation must help in developing the creativity and the initiatives of the working people, on the basis of an awareness of environmental matters. To preserve and enhance the natural environment is not only an affair of the State, the enterprises, and the combines, but also needs the constructive cooperation of every citizen, above all in the socialist competition arena. In the various enterprises and territories, there is a great deal of activity going on for the protection of the natural environment. The work of the social organizations--especially of the labor-union sector, under the slogan "beautification of our cities and communities--join in!"--mirrors the readiness of the working people to improve the natural environment in the interests of society. Numerous collectives are fighting for the honorific title of "Collective of Exemplary Order, Discipline, and Safety," and they are incorporating corresponding measures into their socialist competition. In conjunction with moral stimuli, this activity is also being promoted in a materially effective way.

However, in the utilization of socialist competition, the awarding of prizes to the enterprises and collectives should be made even more dependent than before on the fulfilling of the planned tasks in the area of environmental protection. The stronger development of the democratic collaboration of the entire public on the protection of the environment and on its shaping calls for a well organized social supervision within the framework of national and enterprise committees, and above all the close cooperation of the residents of an area with their deputies in the territory and the enterprise.

This social supervision should contribute to the solution of the following problems:

- Utilization of all the intensification factors for environmental protection
- Compliance with the maximum permissible limits within the predetermined deadlines on the part of enterprises which particularly severely stress the environment
- Continual deepening of cooperation between territorial and enterprise organs, in order to mitigate adverse effects on the environment.

This analysis is confirmed both by the experiences of the Fuerstenwalde Tire Combine VEB, in the solution of its waste-heap problem at the Rauensch brickworks, and also by the information given to the public about planned and realized measures for the protection of the environment.

Fourth: In the program of the SED which was resolved on at the Ninth Party Congress, it says: "In the further refinement of management, planning, and economic stimulation, the purposeful utilization of product-money-relations plays a great role" [4]. This general assessment applies also to economic stimulation in the area of environmental protection. The value categories of prime costs, prices, fees, levies, and so forth must become fully effective in the fight to improve the natural environment. Thus, for example, the prices for products must take into account the production and marketing conditions, inclusive of the environmental conditions. The following requirements are placed on setting prices for products and services deriving from environmental protection considerations:

- The enterprises themselves in principle must generate the resources for environmental protection. However, this does not relate to capital expenditures for the elimination of major damage to the economy or to reductions of detrimental and deleterious effects on human health which are of central importance and which exceed the economic powers of an enterprise or combine.
- Environmentally damaging products must have a higher charge than ecologically safe products.
- The re-use of waste products must be advantageous for the producer or user, especially whenever raw-material prices rise, because "the rising of raw-material prices naturally forms the incentive for the using up of wastes" [5]. By their processing into secondary raw materials, some waste products generate relatively high costs, which at the present time are not yet recognized in the price of the products and which have a detrimental effect on the utilization of waste products.

Only if the price includes all the socially necessary expenditures of the enterprises for the reproduction of their conditions of production, can this price fully fulfill its function.

We must agree with J. Jakowez when he states: "Furthermore, in the assessment of the influence of the factor of nature on price setting and price dynamics, a number of new aspects should be taken into account. Whereas formerly the natural resources employed in the reproduction process functioned usually as freely-obtained forces of nature and thus as a factor which brought down the cost of production, now the situation has changed. For the developing and reproduction of its natural resources (mineral resources, forests, water resources, lands, and so forth), society must expend more work from one year to the next. The expenditure necessary for extracting these resources and thus their value is carried over to the new product in the subsequent stages of the production process, and therefore this expenditure must be reflected in the prime costs and prices of those products which rely heavily on natural resources. At the same time, in view of the increasing shortage of natural resources and the gradual exhaustion of some of them, as well as the rapidly rising costs for environmental protection, the factor of nature is proving to be more and more a price-raising factor, which increases value and prices in the extractive industry. The task of systematic price setting is not only the inclusion of the socially necessary expenditure for geological exploration work, forest and water management, and so forth, but also the economic stimulation of a complex (and as waste-free as possible) processing of the natural raw materials, and a stimulation of the efficient utilization and protection of our natural resources" [6].

In the GDR, the following legal regulations have proved very successful:

- The Order on the Tasks, Status, Organization, and Management of Planning in the Preparation and Execution of Land Improvement Projects, the soil-improvement planning order of 22 June 1970, which provides that in the case of non-observance of the agreed-on targets (raising of the soil fertility and high effectiveness of the ameliorations), price reductions must be granted.
- The Second DVO [Implementing Decree] on the Water Law of 16 December 1970, the Application of Economic Regulations for the Prevention of Water Pollution and for the Efficient Utilization of Underground and Surface Water, which is stimulating the efficient use of water through the imposition of a surcharge of 50 percent on the water-use charge.

But penalties should be applied as an important means of economic stimulation only when the enterprise demonstrably and culpably neglects to follow the requirements of environmental protection; if it exceeds, for example, stipulated limits even though the financial, personnel, and material means for the realization of the planned environmental

protection measures were or are available, or if it has insufficiently developed its own initiative for complying with legal obligations. Sanctions remain ineffective wherever the paying of penalties is more advantageous in the long run than instituting environmental-protection measures. In the interests of the protection of the environment, such behavior patterns must not be tolerated, and they call for administrative measures. Thus, for example, the Grimma Water Treatment Enterprise VEB has prohibited intractable exceders of maximum limits from feeding in their sewage, following an appropriate warning, and has thus forced enterprises to have their sewage carried off by sewage trucks.

The following example should show how advantageously such penalties work when an enterprise strives to observe water-law requirements on its own initiative and with technical guidance: A large metal-working enterprise with various contaminant feed-ins from a canteen, sanitary facilities, and metal degreasing, pickling, and enameling rooms, was burdening the public sewerage system so much, by way of its five feed-in points, that demands which stipulated a deadline for fulfillment were made on it by the Water Treatment Enterprise VEB and the Kreis Public Health Inspectorate. The enterprise was intensively inspected and in consequence a penalty was imposed against it. On account of this measure, the enterprise introduced its own initiative with respect to the waste water from the canteen (contracts placed with project planning offices were unsuccessful), through which the level of the penalties was decreased, and at the same time it asked for help from the Water Treatment Enterprise VEB. Through collective cooperation, it proved possible to substantially improve the water situation.

Since the Water Treatment Enterprise VEB is subject to a sewage charge as the causer of violations of the maximum limits, whenever its cooperating partners act illegally it guides these toward lawful conduct by means of contract-stipulated penalties. In most cases, the enterprises concerned react with corresponding measures. In an analysis of those enterprises which have exceeded the limits (for water) in the bezirk of Leipzig, the following causes of limit violations were observed:

- Inadequate mode of operation of the water-treatment plants
- Overloading of the plants
- Treatment and purification plants which are obsolete and in bad condition
- Wrong manner of operation of the primary installations.

Since the sewage charges can neither be planned nor calculated and are to be included in the prime costs, the enterprises are guided toward the elimination of the causes. Moreover, the judgment can be made that by means of particulate and exhaust-gas charges, a land-use fee, and so forth, an effective joining of legal regulations and economic levers

has been found. However, we must not fail to see the tendency for the effects desired by the legislator to sometimes fail to appear or to not appear to a satisfactory extent: The lack of measuring devices is preventing a supervision of the enterprises, combines, and institutions by the competent organs in some cases (for example, in the water-management sector). At expiration of a certain period, systematic compilations of observations cannot be elaborated, and the multiplicity of interlinked control systems cannot be comprehended and investigated in terms of their interconnected nature.

The example which was mentioned above shows that instruction and help for the enterprises from central and local organs in the process of plan preparation and plan realization is becoming more and more important. Thus, for example, the Leipzig Water Treatment Enterprise VEB is conducting regular instruction sessions for the sewage representatives of the enterprises which are associated with it by contract, in order to make the environment-preserving measures more widely known.

A consideration of the socially necessary expenditures for environmental protection in the costs of products and services of enterprises, especially of products which rely heavily on natural resources, is extraordinarily complicated and poses many questions which at present cannot be answered satisfactorily as yet. These questions include, among others:

- What effects do environmental-protection measures have on reducing the contaminants?
- How should the fact that the expenditure for the protection of natural resources is markedly different depending on the region be taken into account in the planning and calculation of the costs as well as in the price setting?
- How are costing standards to be formed, and costs recorded and defined?

The current costing order [7] allows the enterprises to include their expenses for environmental protection as other costs in the total sum of the production prime costs, but what we have here are costs which are particular to an enterprise, underlying which there are no costing standards, as a rule.

Fifth: In the management, planning, and economic stimulation of environmental-protection measures, not only the economic, but also the social effects are to be taken into account. The decisions made about environmental-protection measures which should be carried out are influenced by the extent of these effects, and at the same time they are a criterion for the qualitative evaluation of the enterprises, combines, and institutions.

BRIEFS

CLEANUP CAMPAIGN IN GOREANGAB--No diatribe can describe the filth staining our environment. However small the gesture, it is at least most commendable, that on Saturday, October 27, an all-out effort will be made to clean up the Goreangab region, particularly the eastern section where the dwindling waters of the dam, have exposed the dirt. Newsmen visiting the area were amazed, despite their knowledge of what was awaiting them, to look at the litter and refuse that had been carried down the river over the years, evidence of a society's total indifference to the preservation of its environment. The cleaning up operation takes place under the auspices of the City Council's Committee for Environment. The idea originated with Mrs Councillor Joey Olivier who heads the City's Neatness and Environment Committees. Groups of school children will be enlisted to do the job whereafter municipal dump trucks will arrive to cart the trash off to the refuse yards. Unbelievable how callous the attitude towards nature conservation! There is not a commodity on the market, sold in either can, carton or plastic holder, that cannot be picked up in the region. Yet, despite this polluting of our soil, legislation lacks to deal with those whose behavior is a stain on the entire community. [Text] [Windhoek WINDHOEK OBSERVER in English 13 Oct 79 p 20]

CSO: 4420

USSR CARTOON VIEW OF POLLUTION CONTROL

Kiev SIL'S'KI VISTI in Ukrainian 23 Oct 79 p 4

[Text]



— ТИН СІДІ ВУТ НЕВІСЛИВА СТРУМІНА. А ЗАГЛЯНУВШИ
НА САНІТАРІЙНІ ПОСЛІДКИ, СТАЄ НАДІЮ ПОВІСІТИ.
НАС. В. ВАСИЛЕНКА.

"It's just a little creek now, but it'll be a
big river by the time our factory is built!"
V. Vasilenka

CSO: 5000

PIPELINES AND FISHING CLASH ON THE NORTH SOS'VA

Moscow PRAVDA in Russian 30 Sep 79 p 3

[Article by S. Vtoruchin: "The Sos'va River"]

[Text] We have been sailing on the North Sos'va for two days now, but I'm still astonished at the beauty of its shores. Beautiful aspen and bird cherry leaves rain down onto the cold, dark water unceasingly; long-needle cedars stand solemnly on the steep, sandy banks. This year, the nut harvest has been excellent, and nutcrackers divide up the cones among themselves with a loud chattering. A fish splashes from time to time right off the prow of our launch.

The Coregonus peled is excellent now," says V. Kugayevskiy, the fish-protection inspector for Berezovskiy Rayon. "Each is half a kilo or more. It would be sad if all this no longer existed on the Sos'va...."

The North Sos'va is an unusual river, famed for its celebrated herring. That is a local name for the little fish they catch here; it is in fact a whitefish, not a herring. This river also contains the country's largest school of river peled, or herring, as it is called in Western Siberia. The Berezovskiy Combine alone catches upwards of 10,000 quintals of it in some years. More than 70 percent of all the broad whitefish (Coregonus nasus) in the Ob' basin comes here for spawning. So this river is of considerable importance to the fisheries of the entire Russian Federation. But is there cause for alarm today?

Very large gas mains originating at the Medvezh'ye deposit pass through Berezovskiy Rayon. Last year, we began developing the Urengoy'skiy formation, the largest in the country. We are preparing to develop another giant of the north, the Yamburgskiy deposit. This very year we plan to lay yet another super-large gas main. It will intersect many rivers, including the North Sos'va. In the future, we will be faced with laying several such pipeline systems here.

Even now, they are causing perceptible damage to the basin. Stenodus leucichthys nelma has completely disappeared from the river. And none of that herring is being brought in from the upper reaches of the North Sos'va from

their traditional winter bottom depressions. They are wintering in the Lyapina, a tributary of the Sos'va. But the Lyapina is also the wintering grounds of the peled and whitefish. These fish have had to crowd together and abandon a portion of the space to the Sos'va herring.

Pipeline construction has already taken some of the rivers here out of fish production. Quite recently, for example, "Kazynskiy" reindeer-breeding sovkhos was catching up to 3,500 quintals of fish each year in the Kazym, which also flows through Berezovskiy Rayon. After the gas main was laid, fish stopped coming to the river.

It is not just the pipes being laid on the bottom which are harming the river's inhabitants. Construction workers are armed with powerful equipment. A modern pipelayer or bulldozer goes across a stream, damages the stream bed, and it no longer flows to the river. And the Ob' system has specifics of its own. After the end of December, the oxygen content begins to drop sharply from the middle of the Ob' to its mouth. To keep from being asphyxiated, the fish try to reach the brooks and springs. But then they cannot reach the river again....

Along with construction workers, others from various prospecting parties are obstructing the streams. They are clearing forests and they also use heavy cross-country equipment....

"And we are equally disturbed by the mining now being done on the upper Lyapina," complains G. Tarkhanov, director of the Berezovskiy Fish-Processing Combine. "If it becomes extensive, all the whitefish spawning grounds on the river could be destroyed, including that of the Sos'va herring. If that happens, in a few years we will speak of that fish only in the past tense."

These fears are not groundless. There have already been cases of untreated water with enormously high contents of suspended mud and silt particles being discharged into the river. Settling on the bottom, they cover pebbles and the eggs laid on them with a thick film. Spawning grounds silt up. It is then impossible to restore them.

One other problem -- the picturesque shores, peaceful current and good fishing spots are attracting more and more amateur tourists here each year. They are after taimen (*Hucho taimen*) and grayling (*Thymallus thymallus*), which have never been game fish; they are natural cleaners of the river and prevent sick and weak fish from reaching the spawning grounds. The herring, peled and whitefish have therefore always had healthy offspring here.

The species balance of fish in the upper reaches of the river is now being disrupted. The unsupervised catching of predators, and especially taimen and grayling, is to blame. It is hard to stop, as the growing influx of tourists is not being controlled.

How can we help the North Sos'va? What must be done to not only preserve this generous watershed for our offspring, but to augment its riches?

We began operating the Vanzeturskiy Fish Hatchery on the North Sos'va several years ago. When it reaches designed capacity, 5.3 million young peled and year-old muksun (*Coregonus muksun*) will be released into the river each year. This will be quite a help to the basin. A roe collection base is now being built alongside the settlement of Sos'va. For the time being, it is being incubated in Tobol'sk, Khanty-Mansiysk and Surgut, but in time, a fishery will appear on the North Sos'va as well. However, all this only partly compensates for the loss. We need here a whole complex of well thought-out measures.

An expedition from the USSR Ministry of Agriculture's Scientific Research Institute of Environmental Protection and Preserves recently visited the upper reaches of the North Sos'va. Its tasks included studying the possibility of organizing a nature preserve here. Fishermen warmly embraced this concept. A park would enable us to regulate tourism and supervise the activities of industrial enterprises within that zone. Fishermen would retain the right to exploit the reservoir intelligently. And the North Sos'va has reserves.

In the opinion of specialists from the Siberian Scientific Research and Planning Institute of Fisheries, the Sos'va herring catch in the river could reach a thousand quintals a year. Thus far, less than 400 quintals has been caught in the very best years. The reason is that when the herring are swimming up, the peled are also beginning to run. According to regulations, the herring catch must not exceed 10 percent. If the herring run with the peled, fishermen are not permitted to cast nets into the river at all. Thought should obviously be given to more flexible fishing regulations and to improving how the fishing industry itself is organized. The life of the Sos'va herring is brief, 3-4 years. Some die even if they are not caught by the fishermen's nets.

A number of problems require the active participation of scientists. Many specialists think that Sos'va herring roe can be incubated just like that of the peled or whitefish. In order to establish certainly that this is so, we need to conduct a broad industrial experiment. The first experiments have shown that success would enable us not only to considerably increase the reproduction of herring in the North Sos'va, but also to organize specialized fish farms based on any given closed reservoir. And they should be built by those who have harmed the river.

Questions of compensation for damage to the fishing economy by a developing industry have taken on a good deal of sharpness in Tyumenskaya Oblast. And it is not just a question of accidents at oil and gas fields and pipeline systems, when petroleum or gas condensate reaches reservoirs directly. These things happen, but they are exceptions. Something else is quite a bit more serious. The Glavrybvod has concluded that the damage from laying just one pipeline, the oil pipeline from Ur'yevsk to Yuzhnyy Balyk, across the Ob' and its tributaries, has been 15 million rubles: construction of a crossing for the steel main across a water obstruction creates an artificial barrier to valuable fish moving to their spawning grounds. Significant portions of fish-producing sectors are put out of action. And many pipelines are being built here.

Unfortunately, the Ministry of Petroleum Industry has refused to erect any compensatory facilities whatsoever, although under the statute in effect, their construction must be taken into account in the estimated cost of an oil pipeline or other industrial installation. Oilmen are not even accepting for execution what fishermen have managed with great difficulty to include in the titles list.

Thus, in constructing the Surgut-Yuzhnobalykский petroleum products pipeline, the gas-processing plant was to have built the Surgut fish hatchery and the Sogom-Yendyrskiy lake fish farm as compensation for damage to the fishery. However, the Ministry of Petroleum Industry refused to allocate the money for even planning these projects. Oilmen did not even want to hear anything about building something for the fishermen. And the Ministry of Gas Industry hasn't behaved any better. True, gasmen have allocated money for the technical-economic substantiation of the construction of fishery projects; however, it refuses flatly to put those projects up. And the RSFSR Ministry of Fisheries is unable to do so. Such cases would, it would seem, have to attract the attention of the USSR and RSFSR councils of ministers and the USSR People's Control Committee. After all, the matter concerns protecting fish resources not just of the North Sos'va, but also of the entire Ob' basin, in which upwards of 70 percent of our country's whitefish live.

Neither can we consider as normal the fact that financing to build compensatory fishery projects stops after pipelines are released for operation. Due to the shortage of skilled specialists and the weakness of planning organizations in the RSFSR Ministry of Fisheries, more time is often spent just on making blueprints for a fish hatchery or fish farm than is spent on laying a steel pipeline.

The Ministry of Finance should approach this problem intelligently. Of course, it would be very good if fishery projects could be released for operation simultaneously with oil or gas industrial installations. But their construction needs to be financed even when it is late in starting for some reason.

Specialists think the Siberian Division of the USSR Academy of Sciences should be concerned with the problem of stopping damage to the Ob' basin and its tributaries due to industrial development. Even today, we still do not have a complete picture of the amount of damage, and many fundamental problems of protecting and increasing fish resources in Western Siberia are not yet clear. Each oblast resolves these problems in its own way.

I flew out of Berezov on a clear, sunny day. When the plane began gaining altitude, both the North Sos'va and the Ob', with its numerous channels and floodland lakes, opened up under the wing. Fishing ships and boats could be seen in spots on the smooth surface of the water. It was fishing season. In these parts, people have been linked to the river from time immemorial. It provides them with work and food. Everything necessary must be done so that fishing here can withstand the onslaught of industry and develop successfully.

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ESTONIAN INDUSTRIAL WASTE TREATMENT FACILITIES OPERATING POORLY

Tallin SOVETSKAYA ESTONIYA in Russian 9 Aug 79 p 2

[Text] Environmental protection is a complex problem, one component of which is ensuring the cleanliness of bodies of water such as seas, lakes and rivers. In this area, what characterizes our republic? Our part-time correspondent, S. Mityurev, asked Aarne Eypre, chief of the Tallin Water Management Inspectorate, about this.

"I should like to remind you," said A. Eypre, "that in March 1974, a convention on protecting the Baltic Sea from pollution was concluded in Helsinki. Representatives of seven countries, including the Soviet Union, signed that document. In 1976, the USSR and Estonian SSR councils of ministers issued special decrees and outlined concrete steps enabling us to reduce to a minimum and then eliminate entirely pollution of the Baltic Sea by industrial discharges containing harmful substances. Concrete schedules for actualizing the indicated measures were also determined. By 1980, it is anticipated that no untreated wastes will be discharged by a majority of the large cities or enterprises of the republic. In order to achieve this, we are faced with building a whole series of purification facilities."

"It should be noted," continued A. Eypre, "that the construction is going well, as a whole. Thus, back in 1977 biological treatment facilities were put into operation at the Kekhraskiy Pulp and Paper Plant. Late this past year, the republic's largest treatment facilities of this kind were put into operation at Kokhtla-Yarva. Construction of the central treatment center in Tallin is proceeding apace, permitting us to hope that the first line will be released to the state commission promptly.

The situation with regard to construction of the treatment facilities in Pyarnu (being done by the Pyarnu mobile mechanized column) stands out on this background. The situation here cannot be called anything but unsatisfactory. The work was begun back in 1968, but was not confined to the established time frame. Of a total project cost of 4.1 million rubles, more than 500,000 rubles had been utilized by the start of this year. The construction has not moved forward very fast during the first half of 1979 either: only 15 percent of the remaining work was done. Of course, the fact

that our republic has no specialized administration to do complex hydraulic engineering work also plays a certain role in the failure to meet schedules for releasing treatment facilities for operation. However, the primary reason for the delay would seem to lie elsewhere. Thus, poor work quality has led to a situation in which we have been forced not only to do a great deal of work over, but also to the redesign of individual units due to errors permitted during construction. And the customer, the Pyarnu Soviet of People's Deputies ispolkom, bears a significant share of the blame because it has not been able to organize effective supervision of the construction.

The republic capital now has about 100 local treatment systems, but they are not always and everywhere being operated sufficiently efficiently. One is often forced to hear from the production workers that equipment is obsolete and capacities are inadequate. But that is not the problem. Numerous checks made by our inspectorate testify to the fact that the problem of top-priority importance is the quality of operation of treatment facilities. Like any other equipment, they require daily care, regular maintenance and periodic repair. But enterprise leaders quite often "have no time" for this. Hence, violations. For example, the "Tallinavtotrans" association. The same kind of discharges, containing petroleum products and mud, are generated at all its branches. How are they treated? Branch No 3 has facilities for this, but they are not operating. Due to expenses on servicing the appropriate systems, discharges at branches Nos 4 and 1 are poorly treated. But the picture is entirely different at branch No 6 of the same association. The same purification equipment is installed there, but the work is organized differently: for a long time now, the inspectorate has found nothing wrong at all. Discharges are being treated rather well at the "Norma," "Orto" and "Estoplast" associations. But the "Kommunar" association, Tallin Construction Ceramics Plant and Maarduskiy Chemical Plant are still far from the sought-after norm.

Once again, I should like to place special stress on the fact that the efficient operation of treatment facilities, which alone can prevent water pollution, depends foremost on the leadership of industrial enterprises.

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POLLUTION CONTROL MEASURES AT LAKE SEVAN NATIONAL PARK

Yerevan KOMMUNIST in Russian 29 Sep 79 p 2

[Article by Candidate of Biological Sciences E. Zakharyan: "Duty of Every Citizen"]

[Text] The national park is required to "dictate" procedures for protecting and using the natural resources of the Sevan basin intelligently. Such is its status. It is for precisely that reason that the staff includes different kinds of specialists. At their own experimental base or jointly with scientific organizations of the USSR and Armenian SSR academies of sciences and other departments, they must conduct research on the problems of Lake Sevan. This creates the basis for developing scientifically substantiated recommendations on protecting, reproducing and using the basin's natural resources intelligently.

In the center of the specialists' attention are the national park's preserves. They will become bases for studying the fauna and flora of the Sevan area.

Particular attention will be paid to the problem of preventing lake pollution by municipal and production wastes, agricultural runoff, stockraising wastes, and so on.

It should be noted that the "free" nature of natural resources generates an irresponsible attitude towards them. You don't have to look far for an example. In 1977, thousands of cubic meters of untreated water was released into the Lake Sevan basin through sewer mains. This has continued. A majority of the treatment facilities are either inoperative or are operating extremely ineffectively and intermittently.

The time has come to link production economic plans to environmental protection measures. Without this step, all plans to revivify and protect the waters of the Sevan from pollution will remain just talk.

Also astonishing is the fact that planning organizations, when planning guest houses and other recreation facilities on the lakeshore, do not provide them with documentation for building full-value treatment facilities. Practically

all the primitive, amateurish treatment facilities available at these sites are purely symbolic in nature.

From the environmental-protection point of view, a complex situation has also developed in agricultural production. The saturation of several sectors of the Sevan basin (the Areguniyskiy shore and Artanishskiy Peninsula) with stockraising farms has created a very unfavorable situation for many types of flora.

Neither can we reconcile ourselves to the fact that the construction of various projects is continuing within the national park, in preserves, near the country's historical-architectural monuments, without informing or receiving the consent of the park directorate.

Concern for protecting the historical-architectural monuments within the national park is one of the park's purposes.

Sevanskiy Rayon contains 45 primary organizations and 12,800 members of the rayon council for protecting historical monuments. Trips are organized.

Steps must be taken to ensure that the visits by so many people to the preserve will involve no negative consequences.

Problems of organizing short-term recreation have not been solved: there are no parking places for cars, tent campsites have not been set aside. Recreation zones do not meet sanitation requirements. Uncontrolled access of automobiles to the beaches and the lack of appropriate equipment and services hinder the normal recreation of the workers.

In order to solve these and many other problems, the efforts of national park workers alone will not suffice. We need the help of local organs of authority, of each republic resident. Protecting Lake Sevan is a problem which concerns everyone equally.

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RAINWATER FILTRATION DEVICE WINS LITHUANIAN COMPETITION

Vil'nyuz SOVETSKAYA LITVA in Russian 7 Aug 79 p 2

[Text] S. Danilyavichyus, a senior specialist at the Road Surveying and Planning Institute, has developed a plan for facilities to treat polluted rainwater for motor-transport enterprises, bulk plants and gas stations. It has been praised by both customers and the collegiums of other planning institutes, who have decided to use the innovation in industrial construction, agriculture and municipal-services projects. Water passes through special chambers and several filters in a tunnel 15 meters long and two meters wide. It is cleaned of petroleum products and silt. Last year, such a facility provided an economic impact of nearly a quarter of a million rubles.

S. Danilyavichyus won a contest, organized by the Lithuanian republic Trade-Union Council and the Republic Council of Scientific and Technical Societies, for best specialist working on his own personal creative plan. Among the creative brigades, first place was won by a group of specialists, led by commercial fishing department chief R. Sundushnikov, at the Klaypeda Ocean Fishing Fleet.

More than 80,000 scientists, specialists and workers are now competing in the republic on the basis of personal and collective creative plans. Last year alone, the republic economy received more than 70 million rubles in savings and freed more than 7,000 hypothetical workers from manual labor due to the implementation of the innovations they proposed.

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BRIEFS

BALTIC CEMA EXPEDITION--Protecting the waters of the Baltic and seeking out ways of preventing it from being polluted -- these are the tasks facing the international expedition of scientists from Estonia, the GDR and Poland which is leaving Tallin on the Ayu-Dag scientific research ship. This work is being done under the environmental protection program of CEMA member-nations. [Text] [Vil'nyus SOVETSKAYA LITVA in Russian 7 Aug 79 p 1] 11052

RADAR PINPOINTS POLLUTION--Scientists at the Ukrainian SSR Academy of Sciences' Institute of Radiophysics and Electronics have developed a system to reveal pollution of the seas by petroleum products. Pollution is now revealed unerringly by radar. If the radar beam hits an oil slick, characteristic splashes coming from the ocean waves are reflected on the screen. The "radio-eye" is so sensitive that it reveals pollution with a surface thickness of 0.0001 mm. [Text] [Moscow VODNYI TRANSPORT in Russian 4 Sep 79 p 2] 11052

AIR PURIFICATION FILTERS--Specialists at the State Scientific Research Institute of Nonferrous Metals have developed new equipment to clean the air at enterprises. It is a set of filters permitting purifying 10,000 to 25,000 cubic meters of air per hour of harmful impurities. High productivity is not the sole merit of the new installations. As compared with similar units, they are more compact and consume less electricity. Institute specialists are now completing the development of even larger filters which will be widely used at various enterprises of the country. [Text] [Moscow MOSKOVSKAYA PRAVDA in Russian 18 Sep 79 p 3] 11052

WATER TREATMENT SHIP--A ship which will help protect Far Eastern rivers from pollution has left the ways of the Blagoveshchensk Ship Repair and Building Plant. It will take on polluted water from steamships cruising the blue waterways. TASS correspondent A. Krivchenko writes that as the size of the fleet increases, the danger that rivers of the Far East will be poisoned with operating wastes increases. It was therefore decided to create a network of self-propelled treatment stations which will in time service the Amur, Zeya, Bureya, Ussuri and their numerous navigable tributaries. The technology for building such ships has been worked out at the Blagoveshchensk plant, whose collective is starting to manufacture a second river "orderly." [Text] [Moscow STROITEL'NAYA GAZETA in Russian 8 Sep 79 p 2] 11052

DISPERGENTS TESTED--Spraying fields with chemicals by air suggested to Lenin-grad specialists a way of eliminating oil spills at sea. To do this, they proposed dispersants, chemicals which are dispersed over a contaminated section of the water surface from above. They are nontoxic and dissolve easily in the petroleum, congealing it. The effectiveness of the new method has been tested on the Baltic. Only a couple of hours is required to clean up 20,000 square meters of contaminated water. Use of chemical compounds for ecological purposes here results from the strict rules corresponding to the national program of protecting the seas from pollution. These rules stipulate precisely the maximum allowable content of petroleum in the water. For example, in fisheries, it is permissible only at levels of less than 0.01 mg per liter of water. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 23 Aug 79 p 4] 11052

TYPHOON IRVING IN VLADIVOSTOK--All Friday night, the walls of the houses were shaken by gusts of squall winds, and in the morning, the city's residents did not recognize the streets. They were filled with tree leaves, uprooted poplars and traffic signals torn out of the ground. True, the wind was peaceful and quiet in some sheltered places behind strong hills. And it was hard to believe that meteorologists clocked the wind at 38-45 m/sec on capes jutting narrowly into the sea. Typhoon Irving, born several days previously off the Philippines, had hit the city. In Zolotoy Rog Bay, the waves were only a few centimeters. But in Amurskiy Bay, three-meter rollers, an astonishing size for this small, semienclosed body of water, rolled up onto the shore, smashing boathouses and easily jumping over piers. When this happens, Vladivostok residents are interested in only one thing, what's it like at sea? They must know. Each day, hundreds of thousands of Vladivostok residents are at sea. Telephones ring at the Far Eastern Maritime Steamship Line, the "Dal'ryba" association, the "Dal'moreprodukt" and "Vostokrybkholodflot" administrations, and the trawler and refrigerator fleet bases. At sea, everything is in order. The ships' crews in the typhoon zone have received prompt storm warnings and have sought shelter in ports, bays, behind capes and islands. In the city and throughout Primorskiy Kray, an efficient storm watch has been organized. Rayon and kray staffs are working to combat the consequences of the typhoon. The orderliness of the people is stronger than the elements. [Text] [Moscow SOVETSKAYA ROSSIYA in Russian 19 Aug 79 p 6] 11052

RIVER PURITY MONITORING--Moscow, 15 Oct--"Electric monitors" will take over the care for the purity of the Don River in the south of the USSR. Working in the basin of the river are many enterprises, including iron, steel and chemical ones. All of them are provided with purification facilities. If industrial effluents appear in the water, automatic stations will instantly determine the source of pollution. Such automated monitoring systems function on some other rivers, and in the future will cover all water bodies in the USSR. NAB/TASS [Text] 'Rangoon THE WORKING PEOPLE'S DAILY in English 17 Oct 79 p 7]

MINISTRY OFFICIAL: GOOD CHANCE FOR CHEMICALS BILL PASSAGE

Bonn DIE WELT in German 29 Sep 79 p 5

[Interview with Prof Hanns-Georg Wolters, State Secretary in the Federal Ministry for Youth, Family, and Health, in Bonn by WELT correspondent Eberhard Nitschke: "Wolters: A Good Chance for the Chemicals Bill"; date of interview not given]

[Text] Three months after the Federal Ministry for Youth, Family, and Health submitted the draft of a "Bill for Protection From Dangerous Materials" (chemicals bill) to the Cabinet, the Council of Experts on the Environment, through their chairman, Hartmut Bick, bitterly criticized several passages in the draft, the whole of which was called unusable. Background: Some critics claim that environmental protection has been pushed into the background behind the proposed health protection, and fault was also found with paragraphs considered too friendly to industry. In view of this situation, DIE WELT interviewed the state secretary in the Ministry of Health, Prof Hanns-Georg Wolters. The aim of the bill, in view of the presence of some 45,000 chemical materials in over 1 million preparations now on the market, is to "protect, in keeping with the principle of foresight, man and environment better than heretofore from the effects of dangerous materials and preparations."

WELT: Herr Professor, you have rejected the criticism of the experts by pointing to the limits of justifiable burdens on economy and state. In what manner would these limits be transgressed if the suggestions of the Council were followed?

Wolters: The Council of Experts had a different idea right from the start, as it wanted to limit the legally prescribed tests to materials considered dangerous because of their structure or based on previous experience, in order to institute an extensive test program. The federal government, on the other hand, is acting in agreement with the guidelines of the European Community when it proceeds from the idea that all materials have to be tested in principle, that this be made dependent on the quantities produced but also for materials below the quantitative threshold when it appears desirable to expand the test spectrum.

WELT: The government draft did not follow the proposal of the Council to establish a commission of experts that would have technical control over the requirements for proving and testing within the approval and registration process. Are you for or against such a panel?

Wolters: I can imagine that parliament has a positive attitude toward a commission of experts as was, for example, the case at one time during the passage of the medicine bill. But such a commission cannot make decisions, it can only make recommendations. Officials who could be taken to court, if required, must make the decisions. This, naturally, somewhat shrinks the high expectations about such a commission that apparently have sprung into the public mind. A further point: I must be able to tell, with legal certainty, what is being done to those in business and to those who will eventually be endangered by such materials.

WELT: But this is basically a positive reaction, not as far as the expectations are concerned but for the formal part of the proposal. What about the other criticisms? The Council of Experts has said that a further fault of the draft is that certain especially poisonous materials, which occur only in small quantities, are not even included. Is this essentially correct?

Wolters: No, and that is something that the Council of Experts should have known at that time, as we had discussed it with them before the draft went to the Cabinet. There we especially pointed out that a determination can be made so that extensive proofs can be demanded for even small quantities.

WELT: The public has the impression that in view of the participation of the Ministries of the Interior, Economics, Labor, Agriculture, and Health, this draft did not come about entirely without friction. Was it actually meaningful to combine all aspects, namely statutes on poisons, chemicals as seen from the point of view of environmental protection, and industrial protection into a single bill?

Wolters: This was certainly very meaningful, and this point has nothing to do with friction among the departments, as this joint solution has the advantage for the economy that a chemical material does not have to be checked by three separate authorities.

WELT: Is there truly a chance still for a quick passage of the bill, because the Federal Minister for the Interior, who for some time now has not been chairing this activity, has just issued a brochure in which he puts the draft, as he writes, "up for open discussion," and adds that extensive hearings are planned in the Bundestag.

Wolters: I see a good chance for the bill to pass as planned. One reason is that committee hearings during the first reading in the Bundesrat were completed without substantial changes being proposed. One significant point, viewed critically by the Bundesrat, is that rule-making power goes a bit too far. This will have to be discussed during the further law-making process.

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CSO: 5000

GOVERNMENT CHEMICAL WASTE BILL AIDS TO CLOSE ENVIRONMENTAL GAP

Bonn DIE ZEIT in German 5 Oct 79 p 4

[Article by Gunter Hofmann: "The Entangled Bill"]

[Text] Good intentions were not lacking, it was supposed to be a "major achievement": With the aid of a bill on chemical wastes the Cabinet intended to close a gap in environmental legislation. After nearly 2 years of preparation the draft bill is now to hand. How did it happen that the council of environmental experts has pronounced a scathing verdict to the effect that it would have been better not to have a bill at all rather than the one now submitted in draft form.

It is the aim of the authors of the legislation "better than hitherto to defend man and the environment against the effects of dangerous substances." To do so would be overdue. The resistance daily offered to any reforms, the conflicts to which they are exposed if trying for any desirable goal, the ensuing disappointments--all this we may learn from this example, the legislation designed to cope with the consequences arising from scientific-technological progress: A "reform" for the 1980's. The assignment is as typical as the preliminary tepid compromise.

For some time past sensitivity has increased with regard to the "chemical time bomb" (so dubbed by Guenter Hartkopf, state secretary in the Ministry of the Interior). In particular disasters and accidents--Seveso in Upper Italy, the thallium discharge from a cement factory in the Maenster region, lately the Hamburg poison scandal--serve to change consciousness.

Still, the actual impetus was given not by occurrences which are not even referred to in the draft law, but by the rising incidence of acute and chronic poisoning, cancer and birth defects. The authors of the law are aware that the dangerous features of certain chemicals "are often recognized only after they are already in common use." They intend especially to combat the long-range effects of these substances. Until now policy was confined to reactions once something had either gone badly wrong or gotten totally out of hand. In general chemistry continued to be considered a blessing. To be prevented in

future are risks arising from chemicals to men and animals. After all, some 50,000 chemical substances are on the market; several hundred more are added each year. Only very few of them are adequately tested for possible subsequent effects.

The political impetus for the bill came from Brussels: Bonn was made to deal with a problem of apparently little importance. It was called "sixth amendment to an EC directive from 1967." This directive had been designed to restrict the admission and use of dangerous substances and preparations; the sixth amendment aimed to regulate the registration and testing of new chemicals.

Other countries have long advanced beyond this; Switzerland, Sweden, Canada, Norway, France, Japan and America have already enacted laws. The United States, especially, where the public react resolutely and critically to the risks to civilization presented by chemical products, provided a model of exceptionally strict regulations by their 1976 Tosca [Toxic Substances Control Act]. The Bonn Interior Ministry wished to emulate the Americans. However, quite early on more or less as a matter of course the fathers of the planned environmental chemical bill ruled out the subjection of all products to government admission--such as is the case in America. Virtually by osmosis regulative or, more accurately, market economic principles, tend to insiduously enter the legislative process. This is precisely what happened this time also. Industry must produce "freely" and, in accordance with the authorship principle, be itself responsible for the testing of chemicals.

The crucial conflict centers around these tests. Scientists maintain that many of the long-term effects of chemicals cannot be spotted even approximately by quick tests carried out for only some weeks. Many substances, so runs the argument, require many months--even half a year--of testing. However, in contrast to Tosca, the Bonn act provides for registration within only 45 days. The government should therefore at least exercise some supervision in order to find out whether the data provided by the manufacturers are the result of "proper laboratory practice." In the United States the government does have such powers, in the Federal Republic this might not be so. Thorough tests or subsequent checks amount to a kind of indirect permission to produce. While the Interior Ministry might have gone that far, it found itself out on a limb.

Is a national bill in fact required? The health and labor ministries recommended waiting for the Brussels results; the Ministry of Economics has long held the same opinion, and so have the business federations. With the support of the Chancellery, especially of Helmut Schmidt, Bonn nevertheless decided on a national law, to some extent in response to the growing appreciation of the "Greens." This consideration was both correct and legitimate. French President Giscard also had learned from a study of the ecological movement that a chemicals act was necessary. Like Schmidt, he too urged haste.

The "minor solution" as initially envisaged by the Interior Minister, became a "major solution" at the request of the Cabinet. Though this looked like "more," it was in fact the first compromise. Herbert Ehrenberg's Ministry of Labor, Antje Huber's Ministry of Health and Josef Ertl's Ministry of Agriculture were to be equal partners in the endeavor. All of them, though, represent different interest groups. The Labor Minister seems to have expected a modern base for a working substance decree, because the currently effective Bonn legislation dates back to the Hitler era (1939) and could never be cited to international bodies without embarrassment. For nearly 10 years the Health Minister has wished--in vain--for a standardized poison law at federal level. Now both saw an opportunity to achieve what had seemed to be the impossible by an alliance with other and more powerful departments.

The vital battle for the Bonn act was fought in Brussels. The Federal Germans, still full of good intentions, at one time even hoped to be able to progress quickly enough with a national bill so as to serve as a good example to the EC.

But the BDI [Federation of German Industries, VCI [Chemical Industry Federation] and the Economics Ministry of Otto Graf Lambsdorff were agreed on coupling the national act with the "sixth amendment to the 1967 directive." That meant: No unilateral German bill, no "pointed" national advance. According to some of the people involved, the West European chemical corporations, especially those in the Federal Republic and Britain, concentrated their expertise and obvious interests on the battlefield of Brussels. Much was at stake for them. After all, Hoechst, BASF and Bayer-Leverkusen lead the field of major world chemical corporations, and the chemical industry accounts for no less than 15 percent of Federal German exports.

Resistance on Three Headings

Bonn legislators intended to be the advance guard in Brussels; in the end they became the stoplights. In regard to three decisive points at issue the German delegation acted as a brake--and in each case against the other eight member countries--with the Brits wavering.

First in the controversy about the "threshold of registration." At issue here was not even the subjection (on the Tosca model) of new and old substances to the obligation to register. Actually the Economics Ministry compelled the delegation to insist that not even all new substances should automatically have to be registered.

Second the Economics Ministry, like the VCI, resisted the inclusion in the planned basic examination of the "subacute toxicity" of products--that is the investigation of long-term effects, not only the study of immediately apparent effects of a poison.

Third all eight member countries wished from the very beginning to carry out at least simple tests for adverse environmental effects. After a great deal

of haggling behind closed doors the Bonn state secretaries arrived at an agreement among themselves not to carry their resistance in Brussels to the extreme. Ministers Ehrenberg and Huber agreed to support the Interior Ministry, but their support remained rather lukewarm. In Brussels the way was cleared for the sixth amendment to the 1967 directive.

What in fact is meant by a "national" bill? As in Brussels, here also the Economics Ministry offered the most stubborn resistance in any controversy respecting the efficacy of the law; the Health Ministry conducted a low key struggle for it, the Labor and Agricultural Ministries abstained.

Those involved could take it for granted that the federal executive branch had not failed to note the clash between economics and ecology. Nobody wanted to obstruct innovations, nobody desired competitive disadvantages, nobody voted for less growth. On this point they were all agreed.

In all other respects the departments stubbornly defended their own interests. Aided by the council of experts, the environmentalists of the Interior Ministry aimed to examine particularly long-term and medium-term effects as well as ecotoxic consequences for plants, animals and the environment. The Health Ministry did not consider this wrong but, in view of the serious resistance expected, was quite happy to save at least some of its own concepts. In addition to federal standards applicable to the poison act the Health Ministry was particularly anxious about the immediate toxic effects of substances. From that side, therefore, not much help was forthcoming for the painstaking efforts to emulate Tosca. The ministry did not even object to the proposal to raise the obligation to register in accordance with industry recommendations (currently an output of 1 ton of a particular substance per annum).

The Labor Ministry also confined itself to department interests--everything else was shrugged off. At all times the ministry assigned greater importance to the possible threat to growth rates than to the risks possibly arising from productivity advances. Later the trade unions, especially the IG [industrial labor union] Chemicals, considered that Minister Ehrenberg had failed to press hard enough even for his immediate interests--that is for factory safety issues or the safety of particularly endangered researchers and workers.

Economics and ecology--this conflict divides the departments. Josef Ertl's situation is even more ticklish. On the one hand he is supposed to ensure a sound ecology, on the other hand look after the farmers who are among the largest buyers of chemical substances and the worst polluters. The minister therefore tended sympathetically to watch the department controversies.

Even if we assume that all had the best intentions, it is not to be supposed that this would have been enough to produce a better draft bill. To be mentioned in passing only is the fact that the responsibility for the act was transferred to the Health Ministry. At Helmut Schmidt's request the Cabinet arrived at that final decision last June. The story behind the story? Of course the SPD liked to show the flag in environmental matters. Why should the glory always belong to the FDP? Why always to the Interior Minister?

Moreover, just at that time the Interior Minister was in a rather delicate position in the Cabinet: Following an opposition motion of no confidence, Helmut Schmidt had been compelled demonstratively to defend him. Consequently Gerhart Baum neither could nor would fight for his rights.

Would Baum have done better? It is not even correct to assert that only the Interior Ministry has enough authority, endurance and experience to steer such a complex bill past so many pitfalls. Actually none of the departments has sufficient powers. In this conflict totally unequal "partners" are confronting one another: Here a strong and ultra modern industry which is politicking in Brussels with great expertise, experience and self-interest, there a rather small and slightly antiquated steam engine called "national legislator." In the executive branch this means exactly four specialists at the Interior Ministry, not many more at the Health Ministry, and not even half as many with Ehrenberg.

Not even to mention parliament. Here some environmentalists--originally philologists, lawyers and, at best, an engineer but nary a chemist--intervene in "abominably complex issues," as one of them groaned. Therefore: They must ultimately rely on the appraisal of the departments. And the executive thus rules the roost.

Disappointing and Unsuitable

The trade unions offer a similar spectacle: A one-man band in matters environment, wherever one happens to be looking. It is almost miraculous that the IG Chemicals nevertheless took the side of the advocates of a consistent chemicals bill. So far there has not been a comparable example among trade unions in the constant conflict between economics and ecology. Growth concerns nearly always predominate. Not by accident are the environment departments rather sparsely staffed.

The apparatus is the underdog, often almost powerless. Whenever that happens it is the experts who dominate. All parties have them at hand, especially the industry involved. Moreover, even among the champions of the act scientific opinions vary sharply about the steps to be adopted, sometimes to the point of total disagreement. In specific instances the controversy swirls around the most suitable tests on animals or plants and about biochemical procedures.

The end result? To quote the council of environmental experts who wished for an effective bill: A draft emerged, which is "disappointing and unsuitable from the environmental point of view." Nobody now even mentions that the test schedules of the chemical law are to apply also to plant protection substances and fertilizers and to medical drugs. At this point everybody shies away from this kind of effort. Furthermore, it will still be necessary to get enacted the decrees without which the law is toothless--and that is likely to take years. Besides: The opposition will presumably apply the brake as it has done in other environmental controversies. Business has already reminded the legislators that the Bundesrat must give its approval.

The Economics Ministry alone is quite happy. The Interior Ministry fears that now "not even a lifebelt will be thrown into the sea." The trade unions are disappointed and have given their verdict on the coalition. The council of experts feels that it has not been taken seriously. And the Health Ministry is unable to understand all that criticism after those involved in the ministry really fought for the law in Brussels and Bonn to the point of exhaustion.

Now parliament is on its own to complete the legislative process. All's bad that ends bad.

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CHEMICALS WASTE DISPOSAL PROBLEMS CONCERN LAENDER

Bonn DEUTSCHE ZEITUNG in German 5 Oct 79 p 6

[Article by Burkhardt Salchow: "Seveso Is All Around Us"]

[Text] Disposal sites and detoxifiers are everywhere. Hamburg's authorities failed. How do the other Laender check safety precautions?

If authors Koch and Vahrenholt would have needed another piece of evidence in support of their highly controversial book titled "Seveso Ist Ueberall" [Seveso Is All Around Us]: The Hanseatic city Hamburg, its Senate and the Stolzenberg Company (2 years defunct) would have supplied it.

Ecology over economics: That sounds wonderful at party congresses or in interviews. But when we look closer, we note that Hamburg's Mayor Klose simply mouthed phrases. His party friend Holger Boerner, minister president of Hessen, can demonstrate that economics and ecology do not have to clash at all. Yet Boerner is silent--probably for reasons of solidarity. Still: In Hessen it would have been impossible for a ransackable firm like Stolzenberg in Hamburg to be entrusted with such explosive material for processing and disposal.

Operating in Hessen for the last year has been the Hessische Industriemuell GmbH [Hessen Industrial Waste GmbH] (HIM). Stockholders are the Land Hessen and a total of 32 industrial firms. Environment Minister Willi Goerlach (SPD) made available DM90 million for the currently most modern waste breakdown facility in the world and the dumps needed in conjunction with its operations. It was prescribed by law that the Hessische Industriemuell GmbH should be the official buyer to whom industry and trade in Hessen must offer any waste.

All special waste--whatever is not admissible for municipal garbage processing and does not originate with nuclear power plants--must be offered for purchase to the HIM collection center in Frankfurt. Here the liquid, viscous or solid special wastes are weighed, analyzed, processed and--after careful cleansing--inducted into the sewage system. Some of the waste goes to a

heat treatment facility, some--provided appropriate quantities have been collected, which permit economical transportation--is carried for appropriate final disposal at the two special waste dumps in southern and northern Hessen.

Environment Minister Goerlach is vastly pleased: "Lately I have heard very little of factory yards overstocked with special wastes." Hoechst executive board member Fruehauf said: "Nothing is buried on our sites." True, his corporation has just spent DM25 million to construct a residue incineration plant which might jocularly be described as the complete digestive unit. While the previous facility was able only to process liquid residues, the new plant burns solid, plastic and fusible residues. The energy produced by burning this waste is returned to the factory as steam. Savings: 20,000 tons of heating fuel per annum.

The Federal Laender Hessen and Bavaria lead the pack in the field of special waste removal. The progressive attitude of Bavaria is distinguished from that of Hessen only insofar as no one in Bavaria is obligated to offer waste for purchase to only a single processor. On the other hand the capacities of the Bavarian disposal industry are far larger than those of the Hessian equivalent which, for the time being, is compelled to dispose of part of its special waste outside the Land. But by 1981 at the latest the Hessians will be self-sufficient in the sphere of special waste processing. Incidentally, the Hessian special waste monopoly, authorized by the Federal Monopoly Bureau, operates at cost. It does not need to earn dividends.

It may therefore be claimed that Hessen has learned from its environmental scandals in the first half of the 1970's. Nevertheless, still unavoidable in the Hessen chemical conurbation are environmental problems such as Hamburg recently experienced with the Boehringer Company. Still fresh in public memory is the HCH scandal which involved the Darmstadt firm E. Merck at the turn of the year.

Years ago residues from the plant protection factory in Darmstadt were properly buried according to the standards then prevailing--and with the permission of the authorities. All the more painful for all those involved was the subsequent discovery of HCH traces in milk because cows had grazed in the vicinity of the disposal site. One dairy was forced temporarily to stop selling its products though--in contrast to Hamburg--nobody was harmed by this environmental accident.

Some time ago the famous Hessen firm Degussa had to answer to the courts because it had fallen prey to one of those fly-by-night disposal firms which waxed fat by dumping the toxic wastes entrusted to them into the nearest excavated hole. After the establishment of HIM these unsavory characters lost their pasture.

Anyone now carrying special waste from a firm to the HIM collection center in Frankfurt must return to his client a waste waybill certified by the HIM. If he fails to do so, he does not get paid. Moreover, the major chemical

firmas keep precise records of the whereabouts of just the highly toxic substances. These register not only the volume but also the time of day and the names of personnel handling it. Waste disposal in the excavated hole is a thing of the past.

In the words of the VCI [Chemical Industry Federation], "every respectable chemist's hair stands on end" contemplating that which Stolzenberg manager Martin Leuschner did in Hamburg. In the Frankfurt VCI building the regulations regarding the production and destruction of highly toxic substances are considered adequate. The Stolzenberg Company, closed down 2 years ago, had disregarded the regulations but it is claimed to have been atypical of chemical manufacturers and not a member of the 1,700 strong federation.

In Frankfurt not even a trace of sympathy with Stolzenberg can be found. "We do not cover up for any firm which negligently and deliberately infringes regulations in effect," is the comment. The establishment of the chemical industry is intent on definitely showing its distaste for Stolzenberg; it is concerned with its own image which, according to Hoechst director Gottfried Kremer, in any case tends to be rather poor with respect to safety matters. And this although the incidence of accidents at work and occupational disease has developed more favorably in the chemical industry than in other sectors. The accident figures are below the average of industry as a whole and due to only 10-15 percent to specific chemical causes. This is emphasized by Helmut K. Schaefer who, in his capacity as chairman of the committee on dangerous working substances, is among the most influential advisers to the Federal Minister of Labor.

Due to its network of legal regulations, technical regulatory directives, accident prevention provisions and standards the Federal Republic is claimed to be a model worldwide. According to Prof Eberhard Weise (Bayer AG) it is not by accident that in Germany the development of a new and effective plant protection substance takes 10 years. On the other hand he is quite aware that the maintenance of a tolerable environment has now become an important factor in the quality of life.

Hoechst in fact leads the march forward by recommending itself to its neighbors and business associates as a "partner in environmental control" matters. At the same time it is quite certain that the chemical industry will be unable in future either to manage entirely without toxic, carcinogenous, caustic, flammable, explosive, radioactive and easily reactive substances.

Even though one would assume that the 126-year tradition of German trade supervision has provided a solid foundation for safety in the German chemical industry, it is easy to understand that the industry fears the sensitization of public opinion in the wake of the Hamburg poison scandal, which might obstruct further technical advance. Gottfried Kremer knows very well that public opinion tends to be obsessed with safety considerations after spectacular incidents or disasters. "And all new projects are then regarded with some suspicion." Will Stolzenberg thus also impede technical progress?

FRANCE

CONCERN VOICED OVER TOXIC WASTE DUMPS

Paris LE POINT in French 15 Oct 79 p 100

[Article by Roland Mihail: "Danger--Toxic Waste!"]

[Text] There are 33 raw toxic waste dumps posing a serious threat of pollution in France. Here they are mapped for the first time.

This is the garbage of industrial France. A survey of it has just been made by mining industry experts and will now be included in an official work document which LE POINT can add to the black file on pollution.

This astonishing inventory makes it possible to locate on a map of France the most important and the most harmful raw waste sites: those containing uncontrolled discards of toxic refuse. The goal of the experts in mapping these sites was to strengthen surveillance of them and to focus their efforts on the 33 "black spots" with a view to achieving their final elimination.

This is a necessity, indeed an urgent requirement, for some of the dumps of industrial origin involve serious pollution--or the threat of it, affecting the ground water or nearby rivers, following penetration of rain-water to the subsoil.

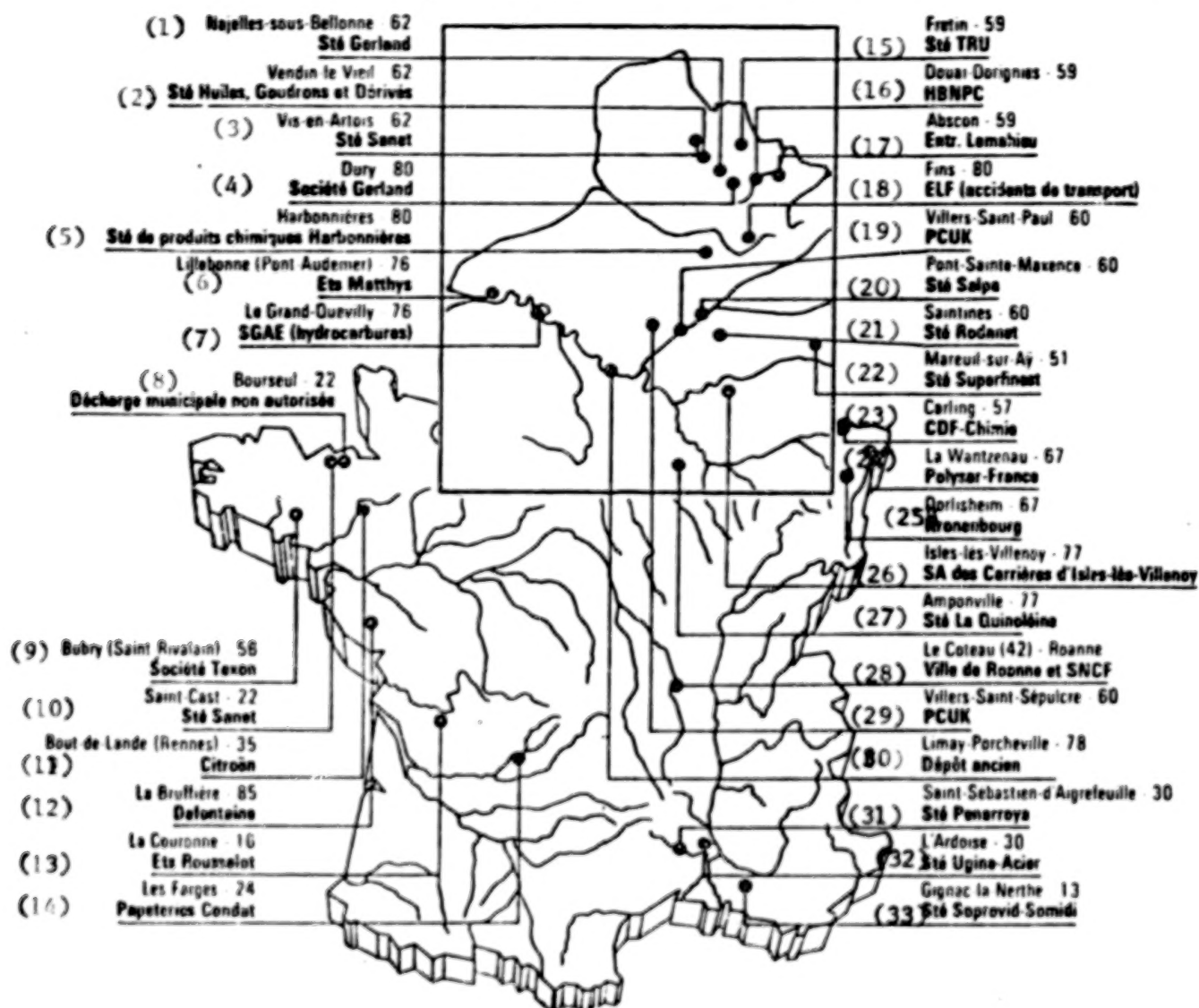
Indeed, since the passage of the law of 15 July of 1975, it has been the industrialists themselves who have had responsibility for eliminating their wastes. Producers, transporters and incinerators of the most toxic of this waste must moreover maintain accurate accounting of their origin, destination and nature. And there are 15 regulated industrial waste treatment centers with a current incineration capacity of 300,000 tons, "detoxification" capacity for 150,000 tons, and soluble oil processing capacity for 51,000 tons.

But in order to meet the real treatment needs, this is still far from sufficient. This in part explains--without justifying--the raw dumps. Obviously, in order to eliminate them entirely, the development of further treatment areas will be necessary. "Controlled dumping," an expert

explains, "is managed according to rules which make it possible to reduce all the disadvantages offered by an accumulation or poor elimination of residues to a minimum."

Unfortunately, in order to extend this network, credit and time will be needed. For the time being, Michel d'Ornano, minister of environment and standard of living, has asked the prefects to put those responsible for raw dumps--when they are known--on real formal notice: they must speedily eliminate them.

It is high time: pollution of the soil also means pollution of farmland.



Key for Map of Dangerous Dumps in France:

- | | |
|---------------------------------|---|
| 1. Najelles-sous-Bellonne--62; | 18. Fins--80; |
| Gerland company | ELF [Gasoline and Lubricants |
| 2. Vendin-le-Vieil--62; | Company of France] (transportation |
| Oils, Tars and Byproducts | accidents) |
| company | 19. Villers-Saint-Paul--60; |
| 3. Vis-en-Artois--62; | PCUK |
| Sanet company | 20. Pont-Sainte-Maxence--60; |
| 4. Dury--80; | Salpa Company |
| Gerland company | 21. Saintines--60; |
| 5. Harbonnieres--80; | Rodanet Company |
| Harbonnieres Chemical | 22. Mareuil-sur-Ay--51; |
| Products Company | Superfinest Company |
| 6. Lisbon (Pont-Audemer)--76; | 23. Carling--57; |
| Matthys establishments | CDF-Chemistry |
| 7. Le Grand-Quevilly--76; | 24. La Wantzenau--67; |
| SGAE (hydrocarbons) | Polysar-France |
| 8. Bourseul--22; | 25. Dorlisheim--67; |
| unauthorized municipal dump | Kronenbourg |
| 9. Bubry (Saint-Rivalain)--56; | 26. Isles-les-Villenoy--77; |
| Texon company | Isles-les-Villenoy Quarries, Inc. |
| 10. Saint-Cast--22; | 27. Amponville--77; |
| Sanet company | The Quinoline Company |
| 11. Bout-de-Lande (Rennes)--35; | 28. Le Coteau (42)-Roanne; |
| Citroen | City of Roanne and SNCF [French |
| 12. La Bruffiere--85; | National Railroads] |
| Defontaine | 29. Villers-Saint-Sepulcre--60; |
| 13. La Couronne--16; | PCUK |
| Rousselot establishments | 30. Limay-Porcheville--77; |
| 14. Les Farges--24; | old dump |
| Condat paper mills | 31. Saint-Sebastien-d'Aigrefeuille--30; |
| 15. Fretin--59; | Penarroya Company |
| TRU Company | 32. L'Ardoise--30; |
| 16. Douai-Dorignies--59; | Ugine Steel Company |
| HBNPC [North Basin and Pas- | 33. Gignac-la-Nerthe--13; |
| de-Calais Colliery] | Soprovid-Somidi Company |
| 17. Abscon--59; | |
| Lemahieu enterprises | |

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